

UNITED STATES PATENT OFFICE.

ALFONS G. SCHURICHT AND GEORGE T. WRIGHT, OF ALTON, ILLINOIS, ASSIGNORS, BY
MESNE ASSIGNMENTS, TO WESTERN CARTRIDGE COMPANY, A CORPORATION OF
DELAWARE.

CARTRIDGE PLUG OR WAD.

No Drawing.

Application filed June 4, 1921. Serial No. 475,150.

To all whom it may concern:

Be it known that we, ALFONS G. SCHURICHT and GEORGE T. WRIGHT, citizens of the United States, residing at Alton, in the county of Madison, State of Illinois, have invented certain new and useful Improvements in Cartridge Plugs or Wads; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to a plug or wad used in cartridge cases to compact and confine the powder charge therein, and particularly to a cartridge plug or wad consisting of a composition material which may be used in place of hair felt hitherto generally employed in the manufacture of wads.

Wads are used in both large and small ammunition to hold the powder charge in place in the cartridge case and in contact with the primer located in the end of the case. In shot-shell, the wads also serve to separate the powder and shot contained in the cartridge. As heretofore constructed, wads consist of discs or plugs usually of felt. Paper and also, to a limited extent, jute have been used, discs of paper being commonly employed for the end wads or sealing caps of shot-shell. In practice, wads, especially when made of felt, or jute and the like, are sometimes coated with a material to prevent fouling of the barrel of the gun.

In the manufacture of small arms ammunition whether of the type having a projectile, or shot, as in shot-shell, or in loading large ammunition, the powder charge is first introduced in the end of the cartridge case in which the cap or primer is located, and a wad is then rammed down upon the powder to compact and hold it against the cap or primer. In order that the wad may serve to properly confine the powder charge, it must tightly fit the inside of the cartridge case, but without accurate sizing beyond that which results from stamping out the material in the form of a disc or plug, as speed and cheapness in production are, of course, essential in an article of this sort. Furthermore, the wad must be constructed of a material such that it may be quickly rammed in place in the manufacture of small ammunition and the loading of car-

tridge cases. This requires that the material be of substantial body and possess a certain degree of rigidity to give it firmness, though it must also be flexible and resilient so that the wads may be cut or punched with a diameter equal to or slightly larger than the inside diameter of the cartridge case to obtain a tight fit by ramming in place. At the same time the material must be relatively soft so that it will not foul the gun barrel. Of the materials heretofore used in making wads, such as specified, hair felt has been found to possess the requisite qualities to the greatest extent, but this material is not entirely satisfactory for the purpose because of its sensitiveness to changes in atmospheric moisture which it readily absorbs, and because of lack of uniformity in the product, both of which adversely affect to an appreciable extent the ballistics of loaded shells; and further on account of its relatively high cost.

The present invention provides a substitute for felt in the form of a composition material that can be produced with marked uniformity in the product, which will not absorb moisture and is, therefore, unaffected by changes in the moisture content of the atmosphere, and which otherwise possesses all the desired qualities for use in the fabrication of wads. Thus wads made from the composition material referred to will improve the ballistics of the loaded shell over the results obtained with hair felt and, moreover, the composition wads may be produced at a cost considerably less than those made of hair felt. This composition consists of a mixture of granular material and a binder, and the invention comprehends a cartridge plug or wad composed of a mixture of such materials, in which the binder is of sufficient body and tenacity to bind the particles of material together and to form therewith a resilient mass. The binder may be a solidified oil or, for example, such substances as gums, rosin, rubber and rubber substitutes; and the granular material may be any suitable comminuted cellular organic material such as ground cork, straw, leather, hair, sawdust or wood meal.

Irrespective of the kind of granular material employed, the plug or wad may consist of a mixture of granular material and a polymerized oil, preferably polymerized

China wood oil. In the manufacture of wads we prefer to use a mixture of ground cork, either alone or with ground wood, and polymerized China wood oil to which a small percentage of a dryer may be added. But whether or not a dryer is added, a mixture of polymerized China wood oil and linseed oil may also be used advantageously.

Where China wood oil alone is used as the binding material, the oil is, for example, polymerized in the following manner: To 95 parts China wood oil, 5 parts of dryers are added and the mixture is then heated to a polymerizing temperature at 220° C. (428° F.) for approximately one hour during which the mixture is constantly stirred. The temperature is then allowed to fall to about 200° C. (392° F.), the stirring being continued. When the mass has acquired a stringy consistency the source of heat is removed and the mixture allowed to cool. We have found that lead resinate, prepared by fusing together 70 parts of rosin and 30 parts of litharge, forms a highly satisfactory dryer for accelerating the final curing upon which the wads depend for their ultimate resiliency, but any suitable known dryer may, of course, be used. The cool polymerized oil is next transferred to a mixing machine such, for example, as a Werner and Pfleiderer machine, and the necessary amount of ground cork is added. The material is kneaded until a thorough mixture of the oil and cork is obtained. After mixing, the mass is spread in a pan the sides of which are of a height corresponding to the thickness of the wad desired, and the material is then compressed or molded by rolling in the pan into a sheet of the desired thickness. The finished sheet is now transferred to an oven in which it is allowed to cure for three or four hours at a temperature of from 95° C. (203° F.) to 100° C. (212° F.). This causes the mass to become cemented, for while before curing the mass is friable, after such curing or cementation, the mass becomes firm, tough and pliable. After curing the sheet is cut or punched into wads.

Instead of making the composition in the form of a sheet and cutting or punching the wads from it, the composition can be pressed into sticks or wads and then exposed to the necessary temperature for a sufficient period of time. When the composition is pressed into sticks, and the sticks have been cured, they may be cut into wads of the desired thickness.

We have found that the best results are obtained in forming a mixture of 60%

China wood oil containing 5% of lead resinate, polymerized as described above, with the addition of 40% of ground cork. Satisfactory results are also obtained by using 64% of China wood oil and 36% of cork, and we have found that a good product may be obtained using a percentage of China wood oil as low as 50%. The product obtained is a pliable article which is particularly useful as a cartridge plug or wad.

We claim:—

1. A cartridge plug or wad comprising, cellular organic material impregnated with a polymerized oil and compressed to form a pliable article.

2. A cartridge plug or wad comprising, cellular organic material impregnated with a polymerized oil and a dryer and compressed to form a pliable article.

3. A cartridge plug or wad comprising, cellular organic material impregnated with a polymerized oil and cemented.

4. A cartridge plug or wad comprising, cellular organic material impregnated with a polymerized oil and compressed and cemented to form a pliable article.

5. A cartridge plug or wad comprising, cellular organic material impregnated with polymerized China wood oil and molded to form a pliable article.

6. A cartridge plug or wad comprising, cellular organic material impregnated with polymerized China wood oil and a dryer and molded to form a pliable article.

7. A cartridge plug or wad comprising, cellular organic material impregnated with polymerized China wood oil and cemented.

8. A cartridge plug or wad comprising, cellular organic material impregnated with polymerized China wood oil and molded and cemented.

9. In the art of making cartridge plugs or wads, the process comprising, heating an oil to a polymerizing temperature, impregnating a cellular organic material therewith, and heating the impregnated mass at a cementing temperature.

10. In the art of making cartridge plugs or wads, the process comprising, heating an oil to a polymerizing temperature, impregnating a cellular organic material therewith, molding the impregnated mass, and heating the molded mass at a cementing temperature.

In testimony whereof we affix our signatures.

A. G. SCHURICHT.
GEO. T. WRIGHT.